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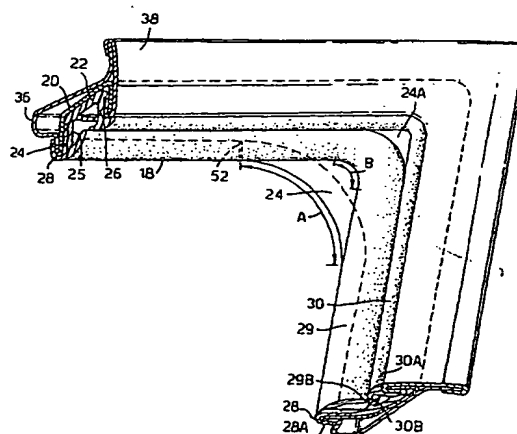
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(54) Title: **SEALING AND GUIDING STRIP FOR A WINDOW**



(57) Abstract: A window sealing and guiding channel (18) for a window frame (12) carried by a vehicle door is arranged to match the sharp angle at the corner (16) of the frame (12). A distal lip (28) of the wall of the channel (18) on the inside of the window is severed from the remainder of the channel side wall (24) from a point (U) on one side of the sharp corner (16), through the sharp corner (16) to the end of the channel, and this lip (28) is bent into a smooth curve (A) to bridge across the sharp corner. The lip (30) on the other channel side wall (26) is also severed from the remainder of its side wall at the sharp corner (16). In addition, the lip (30) of this side wall is cut through to form a mitred joint matching the angle at the sharp corner (16). The remainder of the channel (18) is removed at the sharp corner and replaced by a previously moulded insert having a channel-form at the sharp corner and an extended wall portion (24A) filling the gap where the inner lip (28) bridges across the corner. A third wall (25) has a lip (29) which bridges the sharp corner (16) in a smooth curve between the other lips (28) and (30) thereby hiding the moulded insert (47) from view.

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SEALING AND GUIDING STRIP FOR A WINDOW

The invention relates to a window sealing and guiding channel for a window opening having a sharp corner, comprising a channel base and first and second integral channel side walls made of flexible material, each side wall having a lip extending along its distal edge, the lip on the first side wall being separated from that side wall over a region extending along a portion of the channel including the sharp corner, the separated lip smoothly bridging across the sharp corner, the lip on the second side wall being separated from that side wall at the corner and mitre-cut there to form a mitre joint matching the sharp angle, an insert being secured between the separated lip of the first side wall and the remainder of that side wall over the said region.

The invention also relates to a window sealing and guiding channel for sealing and guiding a window glass having a sharp corner, the channel having a base and integral first and second channel walls each having a distal edge carrying a respective lip, the first wall being cut through to separate its distal edge portion including the lip from the remainder of the wall, the cut extending along the length of the each wall from a first position on one side of the sharp corner, and through the sharp corner, the second wall being cut through at the sharp corner to separate a distal edge portion thereof including the respective lip from the remainder of that wall, the distal edge portion of the second wall being itself cut through at the sharp corner to form a mitred joint therein matching the sharp corner, the distal edge portion of the first wall being

formed into a smooth curve bridging across the sharp corner, an insert being secured in position between and spacing apart the distal edge portion of the first wall and the said remainder thereof, the insert having a size which from the said first position to the sharp corner progressively increases the spacing between the distal edge portion of the first wall and the remainder thereof and thereafter progressively decreases that spacing to zero at a second position on the opposite side of the sharp corner to the first position.

Such channels are shown for example in GB-A-2 311 799. However, the insert, which may be separately manufactured, may present a slightly different appearance as compared with the channel walls.

According to the invention, therefore, the channel as first set forth above is characterised in that the channel further comprises a third wall extending from the channel base adjacent the first side wall and made of flexible material, the third wall having a lip extending along its distal edge which is separated from that side wall at the corner and which follows a smooth curve between the mitre joint of the second side wall lip and the curve of the first side wall lip and which thereby substantially overlies the said insert.

Also according to the invention, the channel as secondly set forth above is characterised in that the channel has a third channel wall having a distal edge carrying

a respective lip, the third wall being adjacent the first side wall and being cut through to separate its distal edge portion including the lip from the remainder of the wall, the cut extending along the length of the wall from the first position and through the sharp corner, the distal edge portion of the third wall being formed into a smooth curve
5 bridging across the sharp corner between the smooth curve of the distal edge portion of the first wall and the mitred joint of the distal edge portion of the second wall and overlying the insert, the remainder of the first, second and third walls and the base of the channel being removed at the sharp corner and replaced by a moulded channel part integrally moulded with the insert.

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Sealing and guiding strips for windows in motor vehicle bodies, and embodying the invention, will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

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Figure 1 is a side view of a vehicle door;

Figure 2 is an enlarged view of the area II of Figure 1, showing one of the sealing and guiding strips;

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Figure 3 is a section on the line III-III of Figure 2;

Figure 4 is a section on the line IV-IV of Figure 2;

Figure 5 is a perspective view of the window frame and sealing strip and corresponding to Figure 2; and

Figure 6 is a perspective view of a moulded insert used in the strip.

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Figure 1 shows a vehicle door 10 carrying a window frame 12. A pane of window glass 14 is slidable in a vertical direction in the window frame 12 and can be raised from and lowered into the lower part of the door 10. The window frame 12 is produced from metal or other stiff material and is formed to produce a sharp corner 16.

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In a manner to be explained in more detail below, the window frame 12 is of channel-shape in cross-section and supports a sealing and guiding strip 18 produced from flexible material such as plastics or rubber and in which the window glass 14 slides. The sealing and guiding channel 18 is designed to provide a weather-proof seal for the edge of the window glass and also to impose low friction on the movement of the glass.

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Figures 2 and 5 show, to an enlarged scale, the window frame 12 and the sealing and guiding channel 18 in the region II of Figure 1. The window frame 12, which will be described in more detail with reference to Figures 3 and 4, defines a stiff mounting channel 20 (Fig. 5) in which is supported the sealing and guiding channel 18. The

channel 18 has a base 22 and side walls 24 and 26. Each of these side walls 24,26 terminates in a respective lip 28,30, the lips having portions 28A and 30A which overlap the respective distal edges of the side walls of the mounting channel 20.

5 A third wall 25 extends from the channel base 22 adjacent the side wall 24. The wall 25 has a lip 29 which has a portion 29A which abuts (but is not connected to) the lip 28 of the wall 24. The lips 29 and 30 also have a portions 29B and 30B which extend partway across the mouth of the sealing and guiding channel 18.

10 As shown most clearly in Figure 5, the longitudinal extension of the lip 30 matches the sharp corner 16 of the window frame 12. However, the longitudinal extension of the lip 28 is shaped differently and bridges across the sharp corner 16 in a smooth radius, as indicated over the region A in Figure 5. At the region A, the side wall 24 has to be extended, of course, as indicated at 24A. The smooth radius region A is
15 positioned on the inside of the window glass 14.

Similarly, the longitudinal extension of the lip 29 bridges across the sharp corner 16 in a smooth radius. This is indicated over region B of Figure 5. It will be seen that the radius B is shorter than radius A and that the smooth curve of the lip 29 follows
20 a path between the smooth curve of the lip 28 and the sharp corner of the lip 30.

The channel 18 is produced by an extrusion process from plastics or rubber.

Figure 3 shows a cross-section through the extruded channel 18 at the line III-III of Figure 2. Figure 3 also shows the window frame 12 in more detail.

As shown in Figure 3, the window frame 12 comprises channel-shaped metal producing the mounting channel 20, a frame member 36 supporting the channel 20, and an outer trim strip 38. The latter is bent to attach it to one of the walls of the mounting channel 20 and to one of the edges (not shown) of the outer frame member 36. The latter is bent over the opposite distal edge of the mounting channel 20.

The window channel 18 defines shoulders 40 and 42 on the outsides of the side walls 24,26 and positioned near the base 22 of the channel. These shoulders 40,42 engage indentations formed in the mounting channel 20 and thus locate the window channel 18 securely in position.

Figure 3 also shows that the window channel 18 includes a lip 44 at the base of the channel against which the edge of the window glass abuts when the window is fully closed. The outwardly facing surface of the lip 44 is covered with flock 46 to provide improved sealing and low friction. As the window glass enters the channel, the lip surfaces 28B and 29B are bent inwardly to allow passage of the window glass. The surfaces of the lip portions 28B and 29B which contact the glass are also covered with the flock 46.

The channel 18 is produced to have the cross-section shown in Figure 3 and a length equal to that from points S and X in Figure 1. However, after the extrusion process, a cut is made through the side wall 24 of the channel of the position indicated by the line 27 to sever the lip 28 from the remainder of the side wall. This cut starts at the point U in Figure 1 and continues to the point T on the other side of the corner. It will be appreciated that, although the start and end points of this cut are indicated on Figure 1, the cut is in fact made before the channel 18 is mounted on the frame. An insert 47 (Figure 6) is then placed in position as will now be described. This insert produces the required sharp corner in the channel walls 25 and 26 and the lip 30 and the required extended side wall 24A over the region A. The insert may be previously moulded and adhesively secured to the channel or may be moulded in situ after the extruded channel has been cut.

Figure 4 shows a section through the channel 18 at a position after the beginning U of the cut. As shown in Figure 4, the side wall 24 has been cut through and a moulded portion 48 of the insert 47 has been inserted. The moulded portion 48 provides the desired increase in the length of the side wall 24.

The moulded portion 48 smoothly increases in size towards the corner 16, thus progressively increasing the length of the side wall 24 as shown in Figure 6 and thereby producing the extended side wall portion 24A.

As shown in Figure 6, the moulded portion 48 merges with a channel-shaped moulded portion 50 which is also shown in Figure 4, being a cross-section at the corner 16. The side walls 25 and 26 and the lip 30 are cut away to accommodate the channel-shaped portion 50.

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At the line C-C of Figure 2, the moulded insert 47 no longer exists, and the separated parts of the side wall 24 are simply secured together - and this is continued to the end T of the channel 18.

10 In this way, the sealing and guiding channel 18 can be given a sharp radius to match the sharp corner 16 of the frame on the outside of the window and a smooth radius on the inside of the window.

Also, by providing a third wall 25, the portion 48 of the insert 47 may be hidden from
15 view by the lip 29 of the wall 25. This is shown most clearly in Figure 4 where it will be noted that the lip portion 29A is in contact with the side wall 24 approximately at the point where it is secured to the distal edge 49 of the moulded portion 48 of the insert 47. Thus the wall 25 completely hides the moulded portion 48 from view. This
20 is advantageous because it means that the sheen and colour of the moulded insert 47 need not match that of the sealing and guiding strip 18.

It will be noted that the effect of the smooth radius for the lip 29 over the region A,

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means that the lip 29 follows a shorter path than the lips 28 and 30; which follow the sharp corner 16. The excess length of the lip 29 is removed by making a cut at 52, removing the excess length and rejoining the ends. The cut 52 could be made at any point along the arc A.

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CLAIMS

1. A window sealing and guiding channel for a window opening having a sharp corner, comprising a channel base (22) and first and second integral channel side walls (24,26) made of flexible material, each side wall (24,26) having a lip (28,30) extending along its distal edge, the lip (28) on the first side wall (24) being separated from that side wall (24) over a region extending along a portion of the channel including the sharp corner, the separated lip smoothly bridging across the sharp corner, the lip (30) on the second side wall (26) being separated from that side wall at the corner and mitre-cut there to form a mitre joint matching the sharp angle, an insert (47,48) being secured between the separated lip (28) of the first side wall (24) and the remainder of that side wall (24) over the said region, characterised in that the channel further comprises a third wall (25) extending from the channel base (22) adjacent the first side wall (24) and made of flexible material, the third wall (25) having a lip (29) extending along its distal edge which is separated from that side wall (25) at the corner and which follows a smooth curve between the mitre joint of the second side wall lip (26) and the curve of the first side wall lip (28) and which thereby substantially overlies the said insert.

2. A channel according to claim 1, characterised in that the base (22) and at least parts of the walls (24,25,26) are removed at the sharp corner and replaced by corresponding parts of the said insert (47,48), the corresponding parts being secured in position in the channel.

3. A channel according to claim 1 or 2, characterised in that the lip (28) of the said first side wall (24) is separated from that side wall (24) not only over the said region but also to an end of the channel, the separated lip (28) being re-secured to the first side wall (24) outside the said region.

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4. A channel according to any preceding claim, characterised in that the lip (29) of the third wall (25) is separated from that wall (25) not only over the said region but also to an end of the channel, the separated lip (29) being re-secured to the third wall (25) outside the said region.

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5. A channel according to any preceding claim, characterised in that the insert (47) is a moulded insert.

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6. A channel according to any preceding claim, characterised in that the insert (47) is secured using an adhesive material.

7. A channel according to any of claims 1 to 5, characterised in that the insert (47) is secured by being moulded onto the channel base (22) and walls (24,25,26).

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8. A channel according to any preceding claim characterised in that the channel base (22), side walls (24,25,26) and lips (28,29,30) are produced by extrusion.

9. A window sealing and guiding channel for sealing and guiding a window glass having a sharp corner, the channel having a base (22) and integral first (24) and second (26) channel walls each having a distal edge carrying a respective lip (28,30), the first wall (24) being cut through to separate its distal edge portion including the lip (28) from the remainder of the wall (24), the cut extending along the length of the each wall (24) from a first position on one side of the sharp corner, and through the sharp corner, the second wall (26) being cut through at the sharp corner to separate a distal edge portion thereof including the respective lip (30) from the remainder of that wall (26), the distal edge portion of the second wall (26) being itself cut through at the sharp corner to form a mitred joint therein matching the sharp corner, the distal edge portion of the first wall (24) being formed into a smooth curve bridging across the sharp corner, an insert (47,48) being secured in position between and spacing apart the distal edge portion of the first wall (24) and the said remainder thereof, the insert (47,48) having a size which from the said first position to the sharp corner progressively increases the spacing between the distal edge portion of the first wall (24) and the remainder thereof and thereafter progressively decreases that spacing to zero at a second position on the opposite side of the sharp corner to the first position, characterised in that the channel has a third channel wall (25) having a distal edge carrying a respective lip (29), the third wall (25) being adjacent the first side wall (24) and being cut through to separate its distal edge portion including the lip (29) from the remainder of the wall, the cut extending along the length of the wall (25) from the first position and through the sharp corner, the distal edge portion of the third wall (25)

being formed into a smooth curve bridging across the sharp corner between the smooth curve of the distal edge portion of the first wall (24) and the mitred joint of the distal edge portion of the second wall (26) and overlying the insert (47,48), the remainder of the first, second and third walls (24,26,25) and the base (22) of the channel being removed at the sharp corner and replaced by a moulded channel part (50) integrally moulded with the insert (47,48).

10. A channel according to claim 9, characterised in that the insert (47,48) is previously produced by a moulding operation.

11. A channel according to claim 9 or 10, characterised in that the respective lips (28,29) of the first and third walls (24,25) partially bridge across the mouth of the channel for contacting and sealing against opposite sides of the window glass.

12. A channel according to any preceding claim, characterised by a lip (44) within the channel and incliningly extending from the base (22) thereof for engaging an edge of the window glass.

13. A channel according to any preceding claim, characterised in that the window glass is a slidable window glass in a motor vehicle.

14. A channel according to claim 13, characterised in that it is mounted in a rigid

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frame (12,20) carried by the door of the motor vehicle.

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Fig.1.

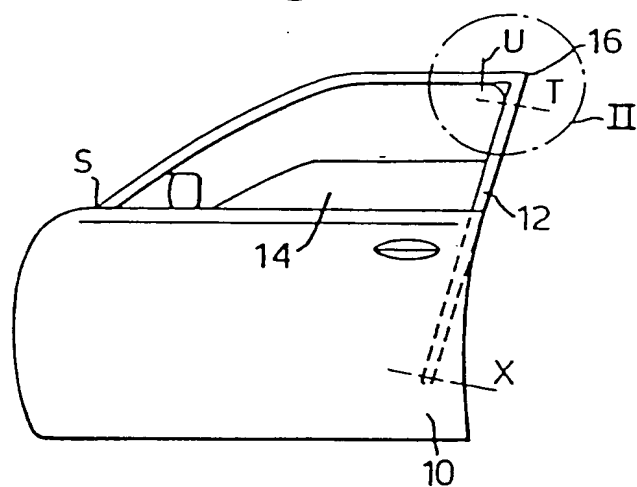
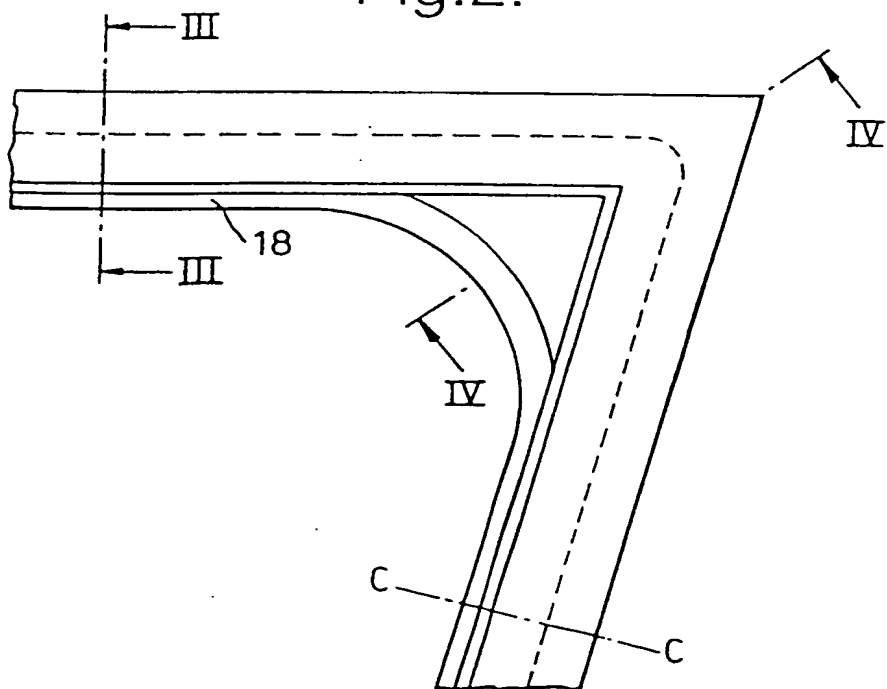


Fig.2.



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Fig.3.

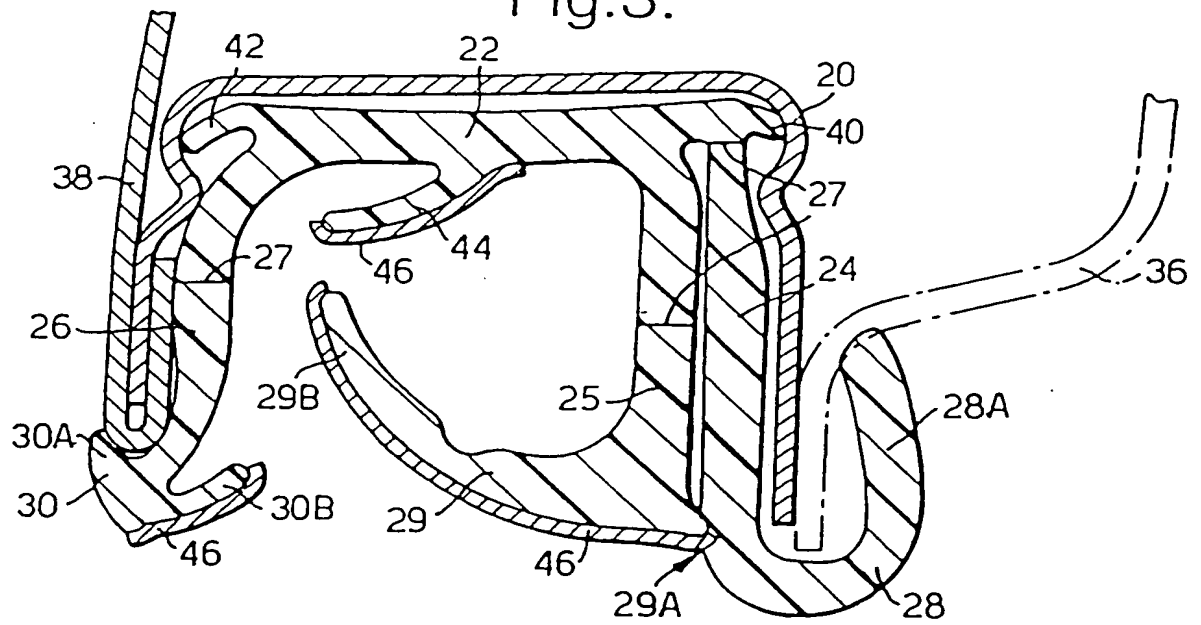
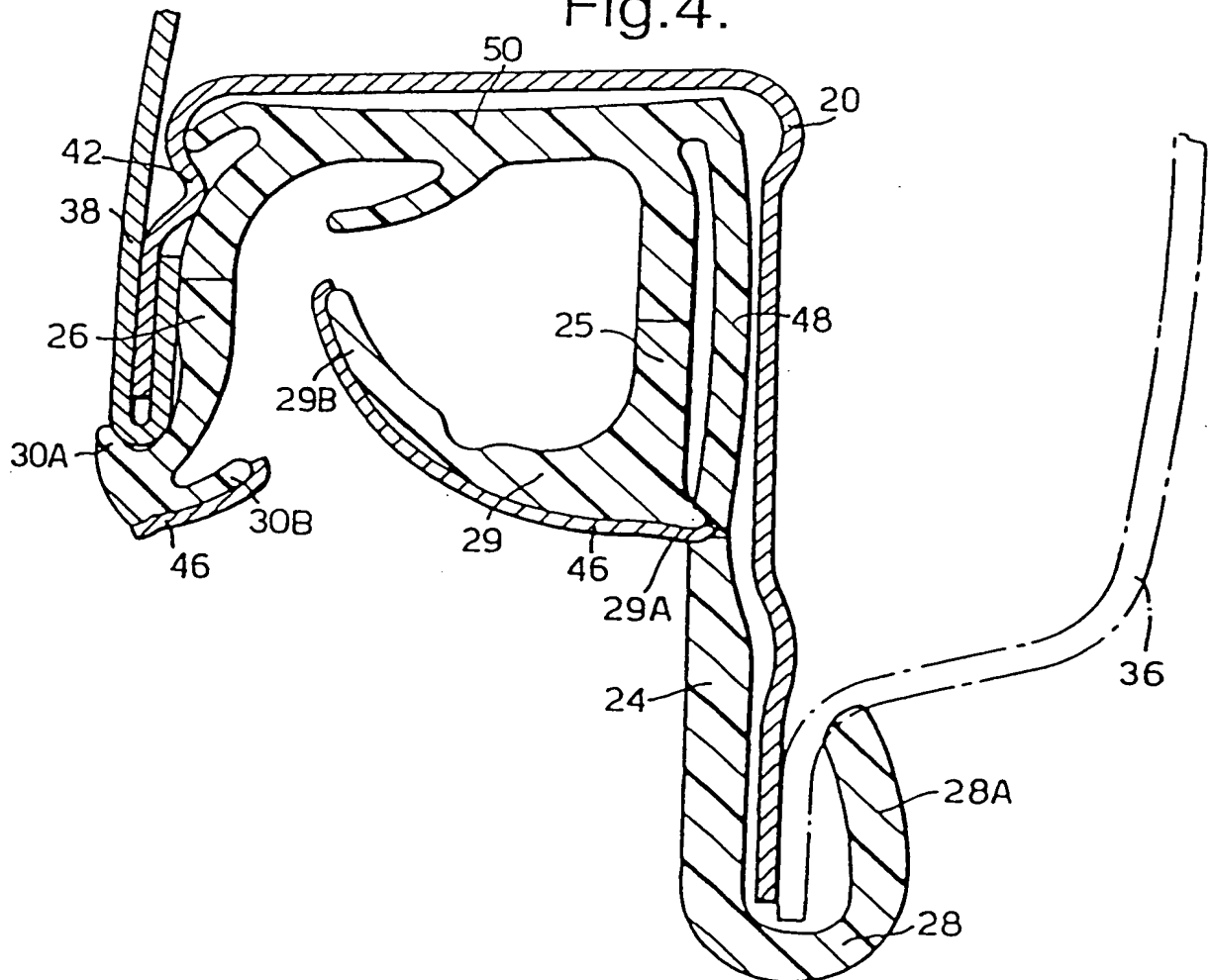


Fig.4.



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Fig.5.

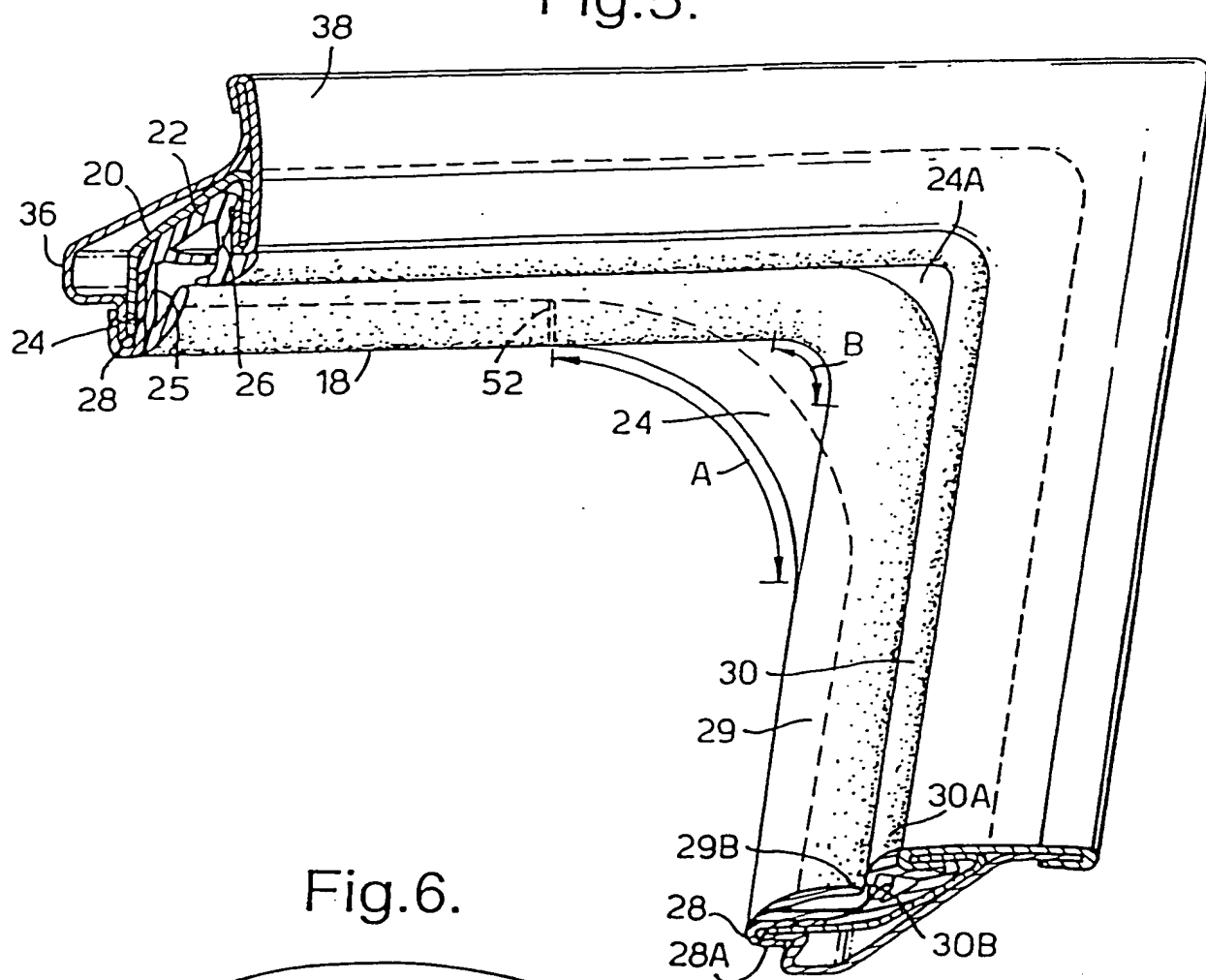
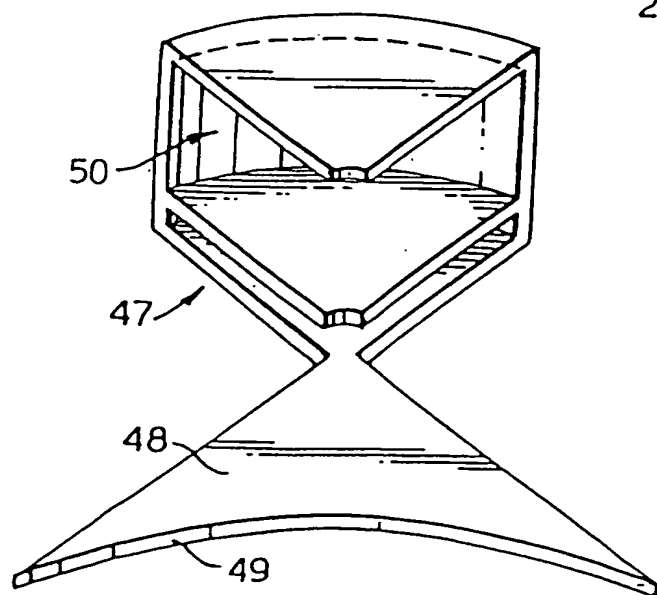


Fig.6.



INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B60J10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 311 799 A (DRAFTEX IND LTD) 8 October 1997 (1997-10-08) cited in the application the whole document	1-3,5-14
A	US 5 269 101 A (NOZAKI MASAHIRO ET AL) 14 December 1993 (1993-12-14) column 3, line 4 - line 68; figures 1-4	1,2,5, 7-10,13, 14
A	EP 0 678 412 A (STANDARD PRODUCTS CO) 25 October 1995 (1995-10-25) column 5, line 3 - line 16; figures 1-3	1,8,9, 13,14
A	GB 2 321 268 A (DRAFTEX IND LTD) 22 July 1998 (1998-07-22)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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